No Silver Bullets : OBIEE Performance in the Real World

Robin Moffatt, Principal Consultant
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Riga Dev Day, 22 January 2015

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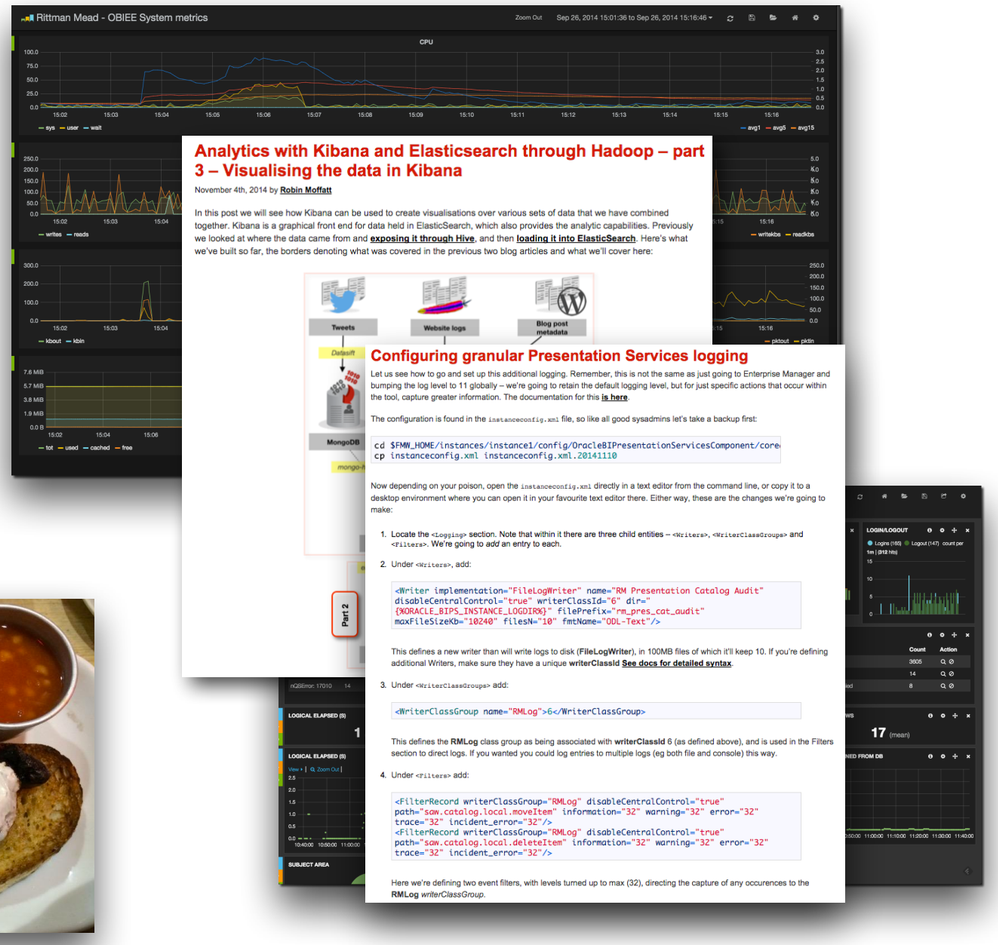
About Me

- Principal Consultant with Rittman Mead
  - Previously OBIEE/DW developer at large UK retailer
  - Previously SQL Server DBA, Business Objects, DB2, COBOL….
- Newly minted Oracle ACE!



- Frequent blogger for Rittman Mead : http://ritt.md/rmoff
- Twitter: @rmoff
- IRC: rmoff / #obihackers / freenode

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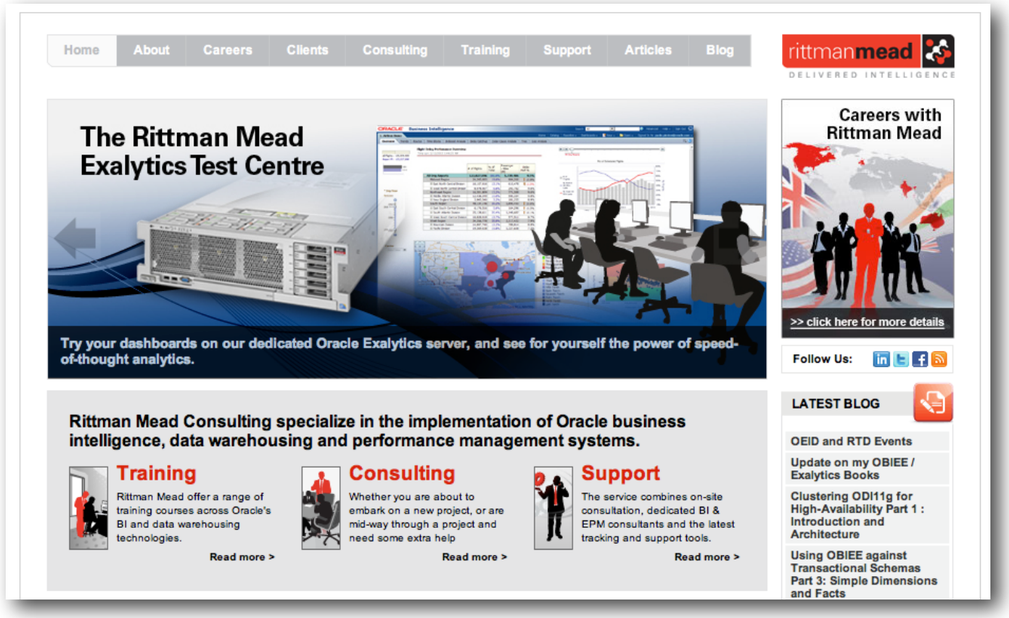
About Rittman Mead

- Oracle BI and DW Gold partner
- *Winner of five UKOUG Partner of the Year awards in 2013 and 2014 - including BI*
- World leading specialist partner for technical excellence, solutions delivery and innovation in Oracle BI
- Approximately 80 consultants worldwide
- All expert in Oracle BI and DW
- Offices in US (Atlanta), Europe, Australia and India
- Skills in broad range of supporting Oracle tools:
  - OBIEE, OBIA
  - ODIEE
  - Essbase, Oracle OLAP
  - GoldenGate
  - Endeca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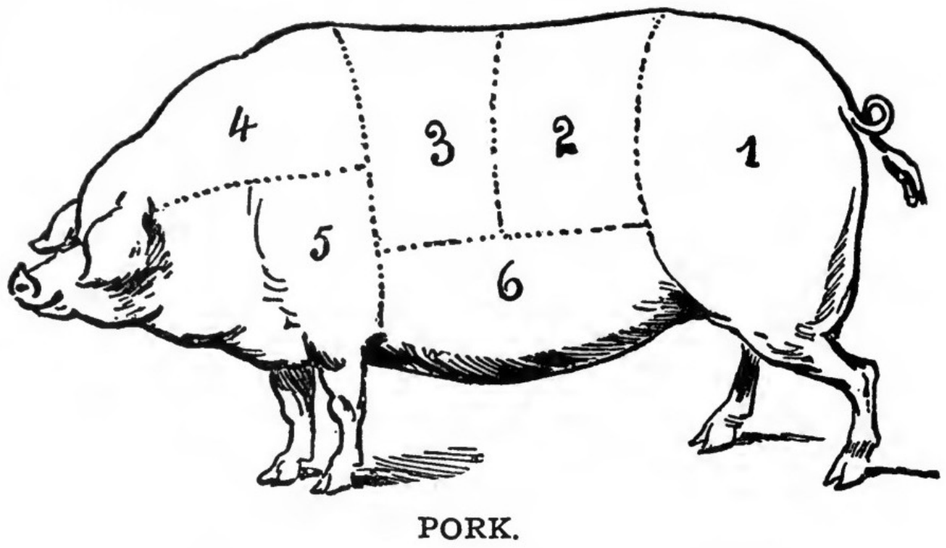
OBIEE Performance in the Real World

- Do It Right, First Time
  - What Makes A Performant OBIEE System?

- If It's Not Done Right, Know How To Figure Out What Is Broke
  - Practical elements of diagnosing the causes of performance issues
  - Methodical analysis - "**nose to tail**"



The Requirement

The Problem

- Lots of moving parts and complexity

- Overall solution crosses disciplines and job roles
  - OBIEE developer
  - Database developer
  - DBA
  - Server Admin
  - Network
  - SAN
  - LDAP
  - etc

The *Additional* Problem

Google

obiee performance best practices

Steps to improve the performance.

1. As explained by Ahmed, you should start to increase the number of connection pool. I would NOT suggest to put 500. Orale is suggesting a maximum capacity of 150 for OBIEE 11.1.1.7. Otherwise, you should apply the Oracle recommendatio

2. You should also check once you solve the connection pool issue to create indexes.

3. You could also increase the PARALLEL_MAX_SERVERS database setting up to 120 depending on your configuration.

9. alter the NQSONFIG.ini parameters

Performance Beyond the “Best Practices”

- Tear down the reliance on “Best Practice”, but **with a viable, better, alternative instead.**

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Time Profile

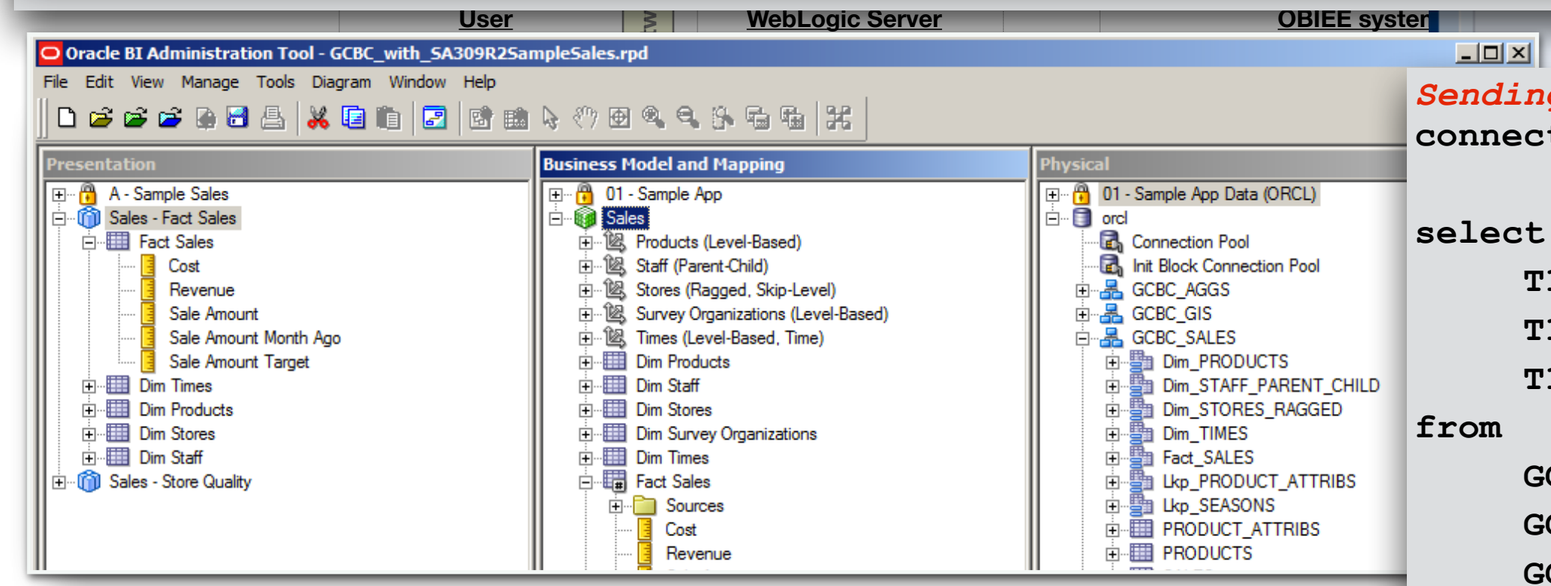
- To understand **why** is it slow, we first must understand ***where*** is it slow

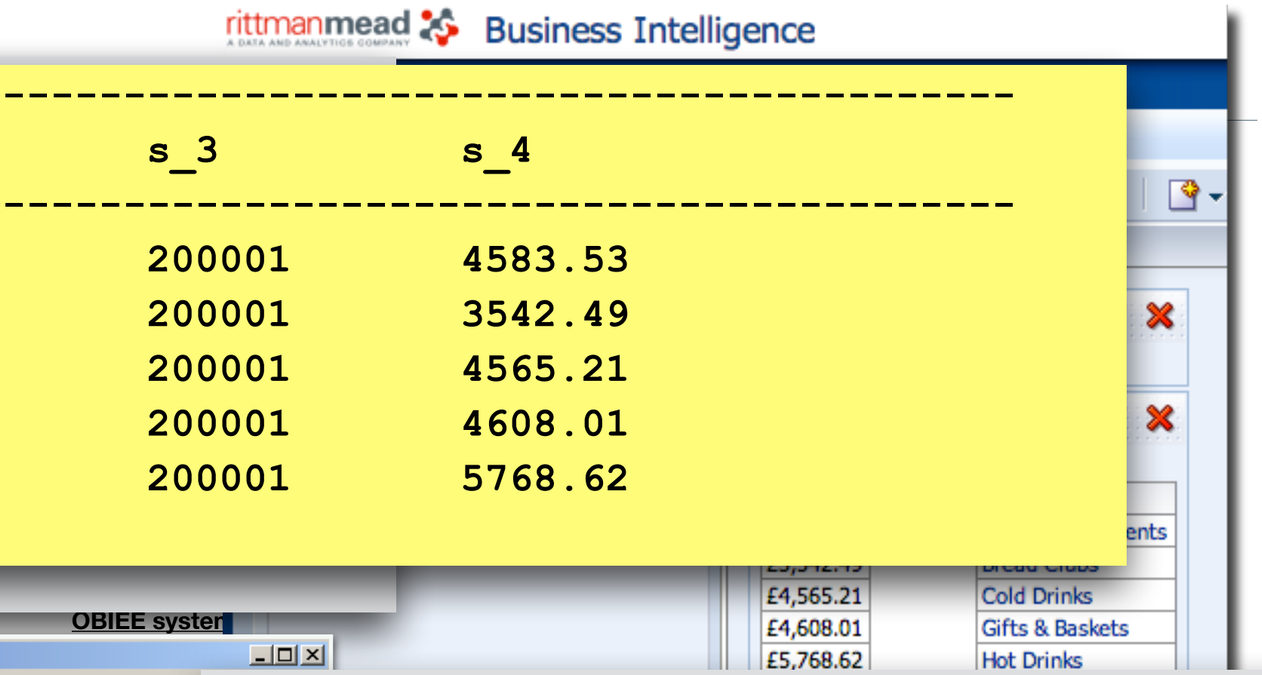
- Approach championed by Cary Millsap / Method-R
  - *"Thinking Clearly About Performance" (2010)*

> ***Performance improvement is proportional to how much a program uses the thing you improved.***
>
> — *Amdahl's Law*

The OBIEE stack


```
-------------------------------------------------------------------------------
s_0          s_1                  s_2              s_3          s_4
-------------------------------------------------------------------------------
0            Bread Assortments    JAN-2000         200001       4583.53
0            Bread Clubs          JAN-2000         200001       3542.49
0            Cold Drinks          JAN-2000         200001       4565.21
0            Gifts & Baskets      JAN-2000         200001       4608.01
0            Hot Drinks           JAN-2000         200001       5768.62
[...]
[...]
```





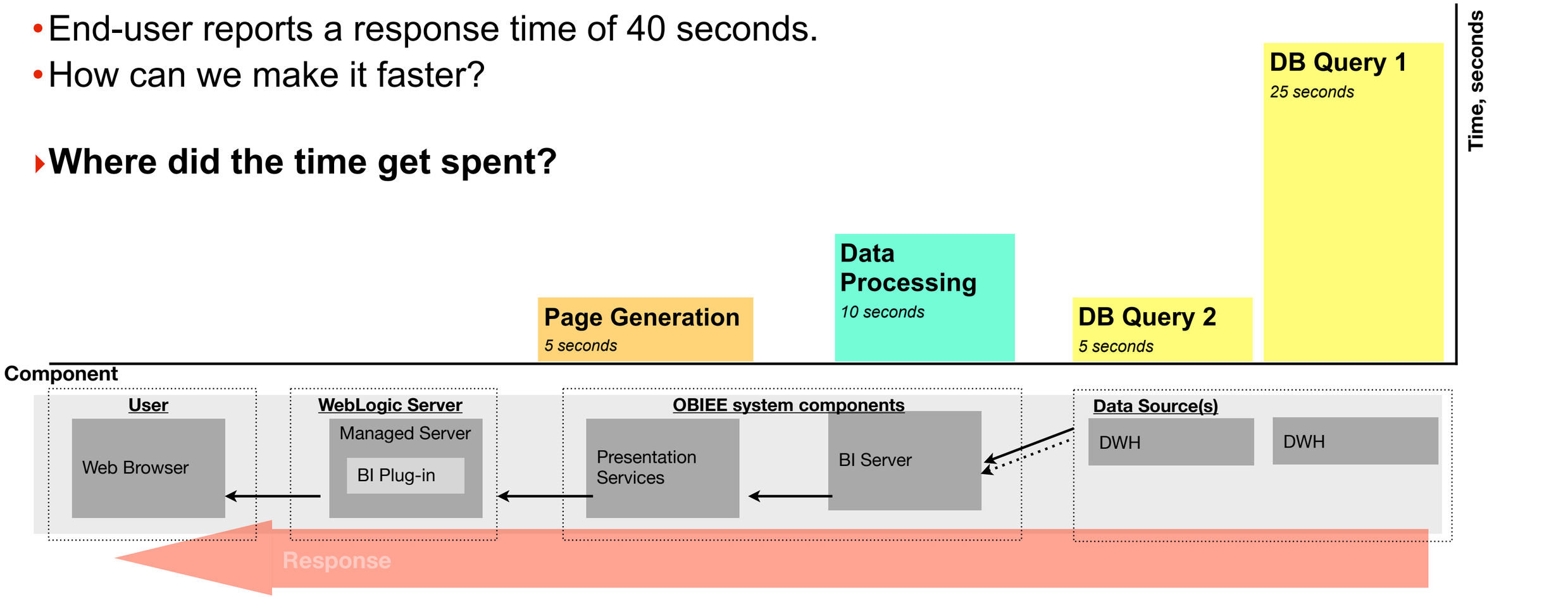

```
Sending query to database named orcl (id:
connection pool named Connection Pool 01

select sum(T117.FCAST_COST_AMT) as c1,
     T107.PROD_TYPE_DESC as c2,
     T127.MONTH_DESC as c3,
     T127.MONTH_YYYYMM as c4
from
     GCBC_SALES.TIMES T127 /* Dim_TIMES */ ,
     GCBC_SALES.PRODUCTS T107 /* Dim_PRODUCTS */ ,
     GCBC_SALES.SALES T117 /* Fact_SALES */
```

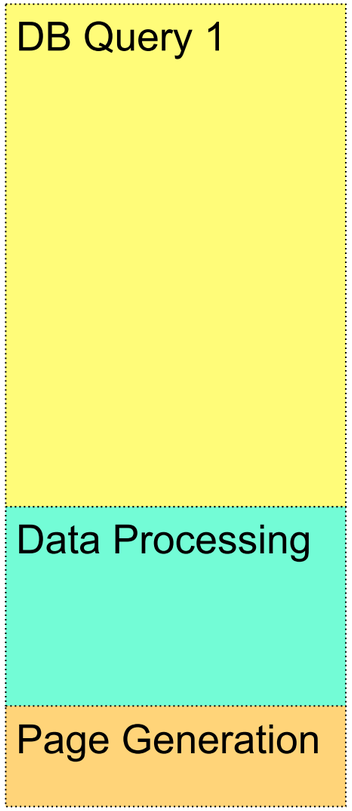
Time Profile in Action

- End-user reports a response time of 40 seconds.
- How can we make it faster?

- **Where did the time get spent?**



Time Profile in Action

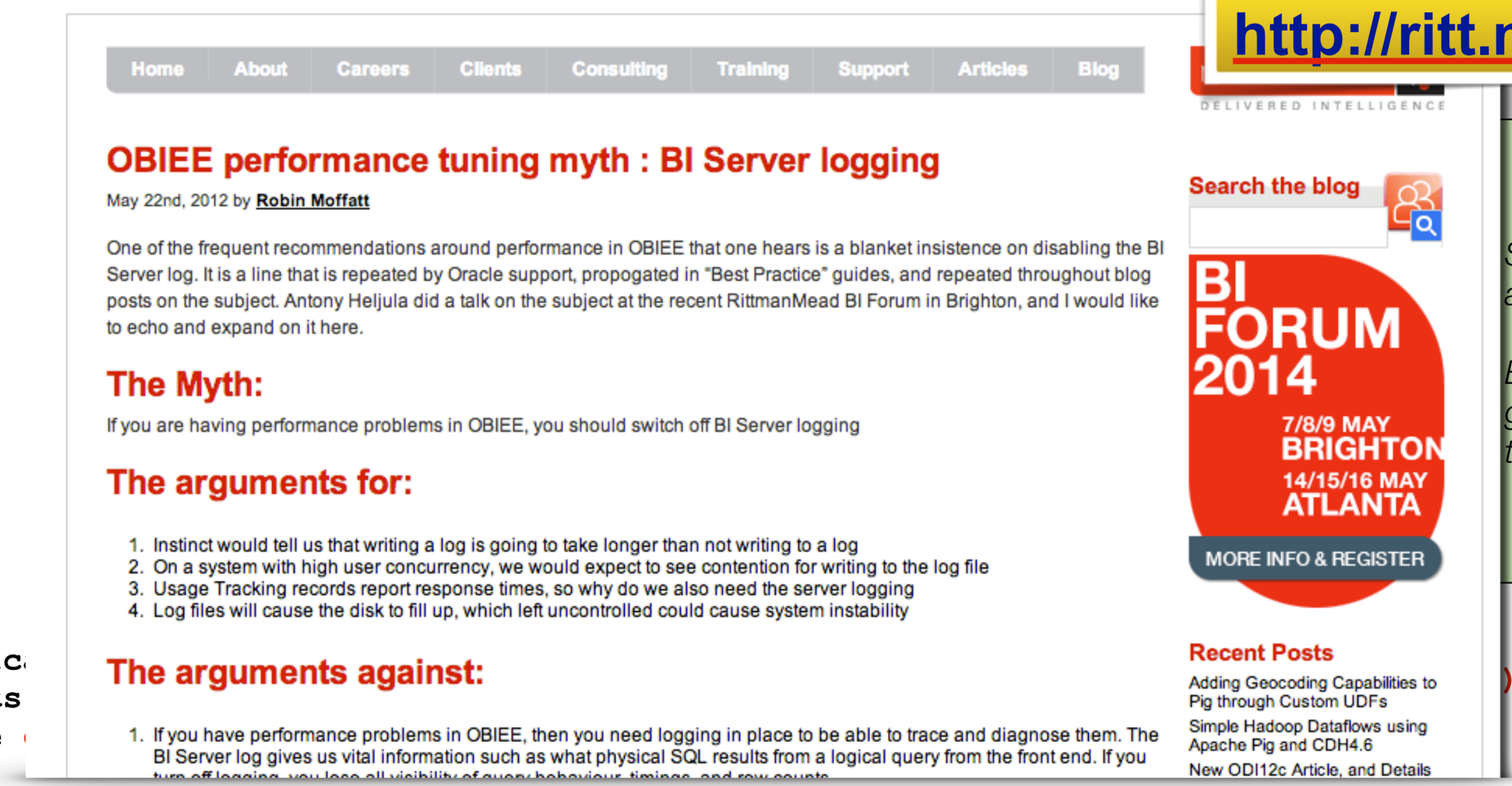


Step	Action	Response Time (s)	%
1	Physical SQL 1 execute on DB	25.00	62.5
2	Physical SQL 2 execute on DB	[5.00]	—
3	BI Server does work on DB results	10.00	25.0
4	Presentation Services generates page	5.00	12.5
	Total	40.00	100.0

Time profile shows clearly :
1.Improve performance of Query 1
2.Push work into single query

Deep Dive into BI Server Time from `nqquery.log`

http://ritt.md/nqquery



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DELIVERED INTELLIGENCE

OBIEE performance tuning myth : BI Server logging

May 22nd, 2012 by **Robin Moffatt**

One of the frequent recommendations around performance in OBIEE that one hears is a blanket insistence on disabling the BI Server log. It is a line that is repeated by Oracle support, propogated in "Best Practice" guides, and repeated throughout blog posts on the subject. Antony Heljula did a talk on the subject at the recent RittmanMead BI Forum in Brighton, and I would like to echo and expand on it here.

The Myth:

If you are having performance problems in OBIEE, you should switch off BI Server logging

The arguments for:

1. Instinct would tell us that writing a log is going to take longer than not writing to a log
2. On a system with high user concurrency, we would expect to see contention for writing to the log file
3. Usage Tracking records report response times, so why do we also need the server logging
4. Log files will cause the disk to fill up, which left uncontrolled could cause system instability

The arguments against:

1. If you have performance problems in OBIEE, then you need logging in place to be able to trace and diagnose them. The BI Server log gives us vital information such as what physical SQL results from a logical query from the front end. If you

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Adding Geocoding Capabilities to Pig through Custom UDFs

Simple Hadoop Dataflows using Apache Pig and CDH4.6

New ODI12c Article, and Details

Send to client, wait for acknowledgement

Eg. Presentation Services generating pivot tables, table scrolling/paging, etc.

e - r

```
Logic
Stats
time
```

Usage Tracking's blind spot

- Usage Tracking is good, but it omits the **Total Elapsed Time**

Elapsed

```
nqquery.log:     Logical Query Summary Stats: Elapsed time e
Usage Tracking:  [Not Available]
```

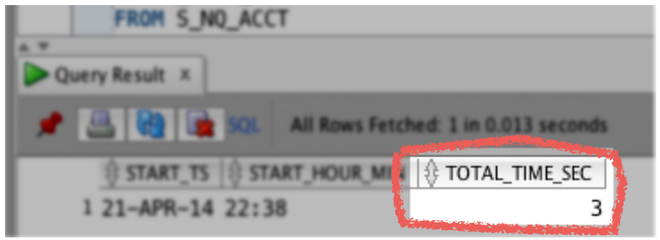
Response

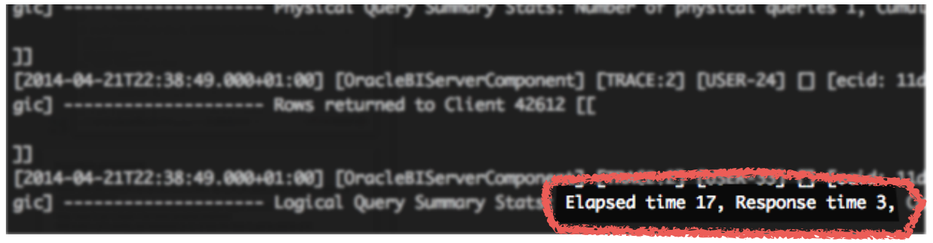
```
nqquery.log:     Logical Query Summary Stats: [...] Response time r
Usage Tracking:  S_NQ_ACCT.TOTAL_TIME_SEC
```

Send to client, wait for acknowledgement

uh oh!

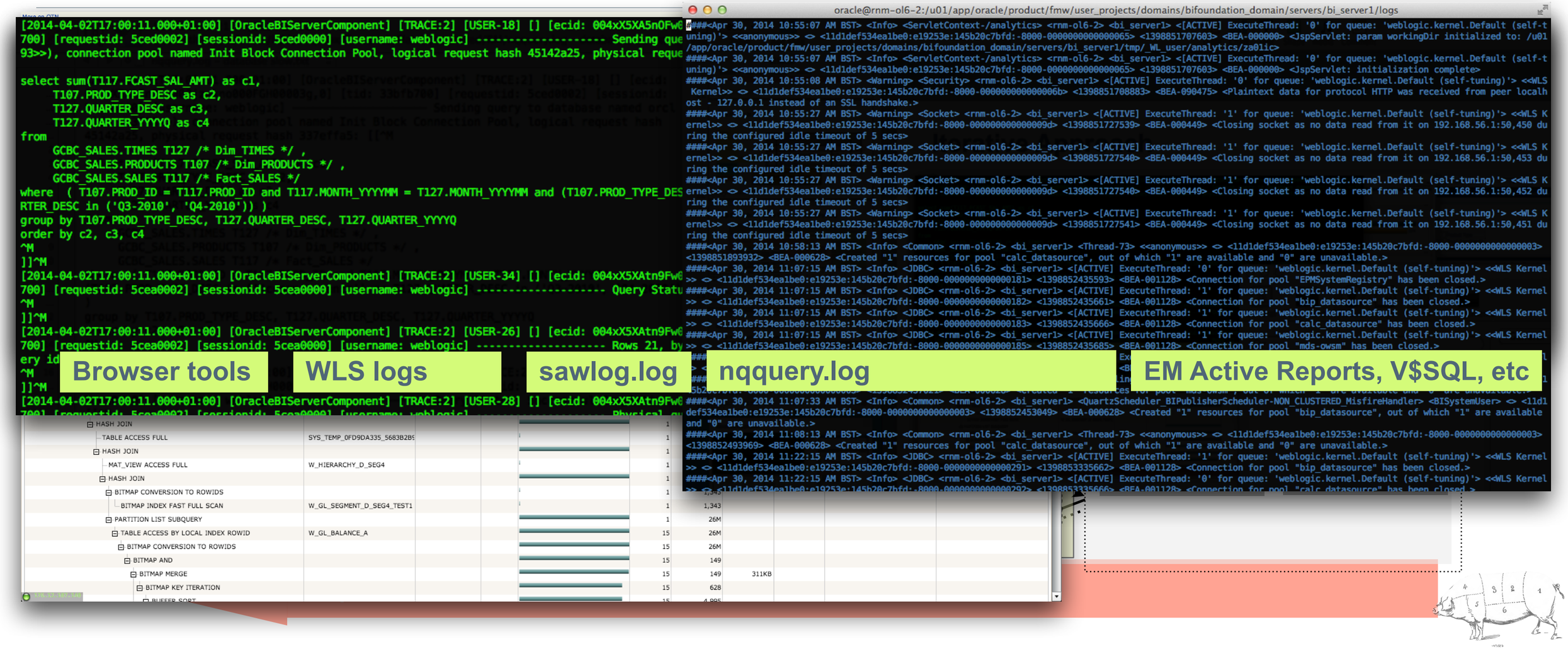
- This can hide problems:





- *Usage Tracking is great, but do be aware of this potential limitation to your visibility of where time has gone.*

Iterative Approach



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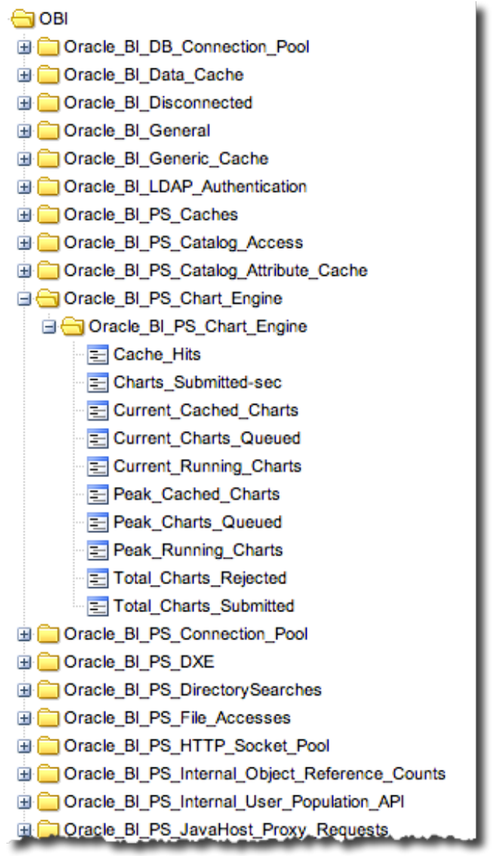
Digging Deeper with DMS Metrics

- OBIEE supports Fusion Middleware's Dynamic Monitoring System (**DMS**)
- Once we have found WHERE the time has gone, DMS metrics are one way to help us find out WHY
- Hundreds of low-level metrics, ranging from the obvious (`BI Server Total Sessions`) to the less obvious (`Peak_DXEParameterizedImpl_Count`)

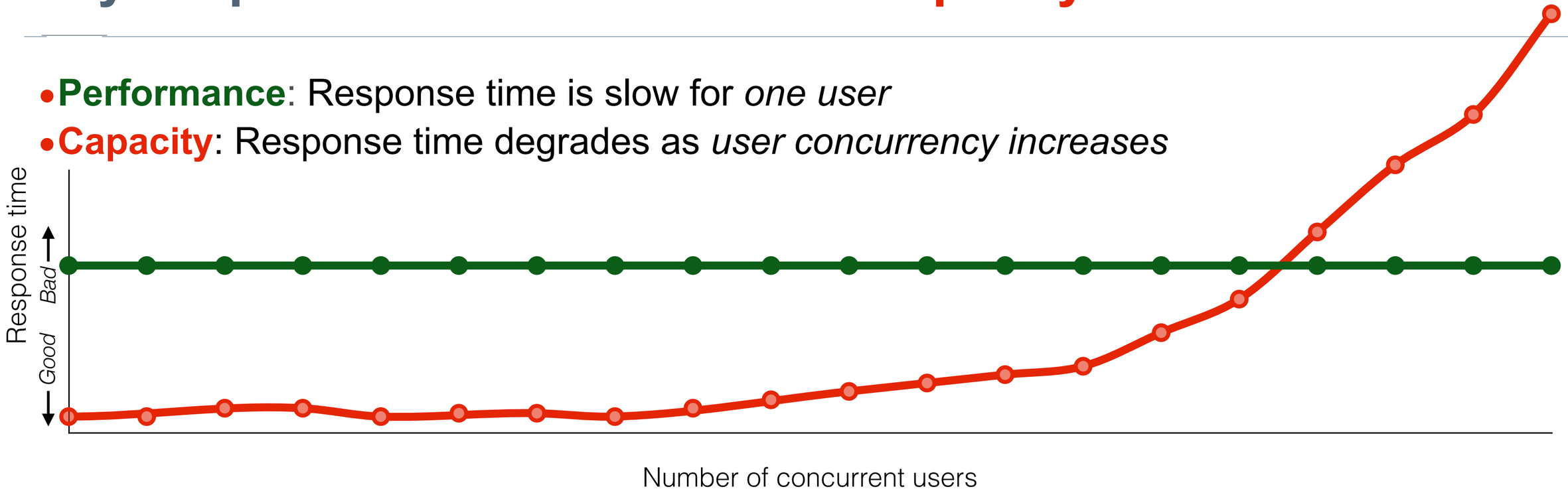


Accessing DMS Metrics

- DMS Spy
- opmn
- EM FMC
- EM12c
- obi-metrics-agent
  + graphite
  + grafana

Is your problem **Performance** or **Capacity**?

- **Performance**: Response time is slow for *one user*
- **Capacity**: Response time degrades as *user concurrency increases*



- Fix **Performance** problems at root cause; *adding capacity alone is generally not sensible*
- Improve the performance of an underlying **Capacity** problem and you might offset the need to add any additional capacity at all.

Performance Diagnostics Approach

- Performance
  - Build a time profile
  - Don't know where to start? Try Usage
    - Long running queries
    - Logical queries returning lots of data
    - Logical queries returning lots of data
    - Logical queries requiring lots of physical queries

Queuing DMS metrics:

```
Oracle BI DB Connection Pool/* -> Current Queued Requests
Oracle BI PS Chart Engine -> Current Charts Queued
Oracle BI PS Query Cache -> Current Queued Queries
Oracle BI PS Thread Pools/* -> Current Jobs Queued
Oracle BI Thread Pool/* -> Current Queued Requests
```

- Capacity
  - Examine capacity metrics (OS, DMS) *over time*
  - Correlate with reported problems

So What Does “Good” Look Like?

This Is Not “Best Practice”

- There is no one right way : **It Depends**

> ***The only “best practice” you should be using all the time is “Use Your Brain”.***
> — *Steven Robbins / Tom Kyte*

The Bucket List of Performance Gains

(h/t Greg Rahn)

★ Don't Do It

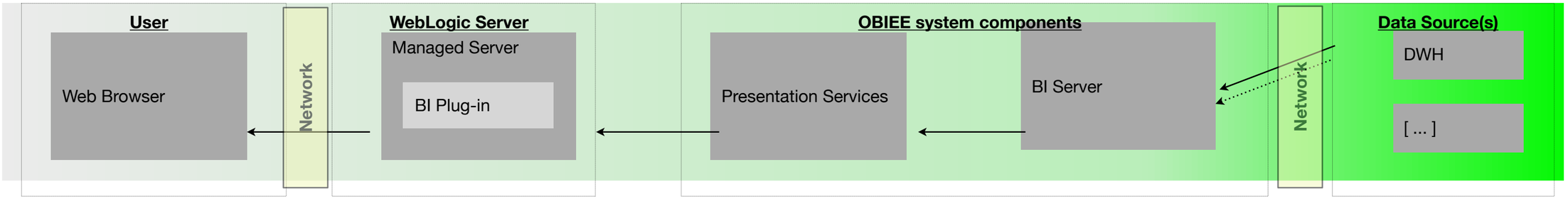
★ Do It Only Once

★ Do It Less Often

★ Do It More Efficiently

‘Database Pushdown’ (Do It More Efficiently)

- Reduce the amount of work/data handled further up the stack
- Federation across sources can be a challenge
  - c.f. BI Server caching



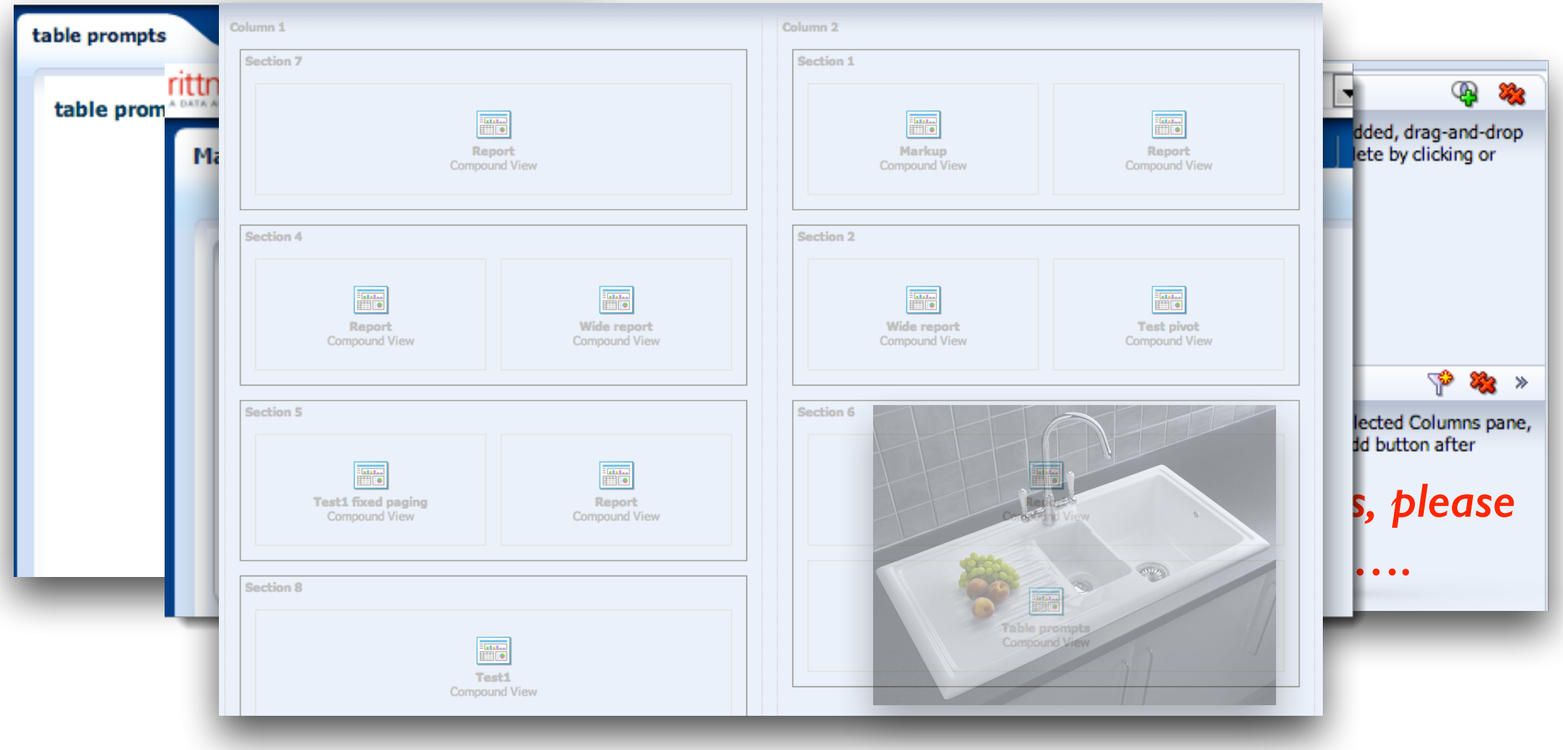
Feeding the Excel Monster (

- What's being done with the data once it's i
  - Could it be done in OBIEE instead?

- Alternatives to Export from Analysis/Dashboard
  - Oracle have specific recommendation
    1558070.1 p.13)
    - Favour CSV export over Exc
    - Favour BI Publisher export ov
  - Use Logical SQL against BI Server
    interface directly
  - Dump direct from the database

Don’t Do It / Do It Less Often

- “Filter Early”
  - Table Prompt != Filter
- Report by Exception
- Make sure Dashboards have default/mandatory prompts (http://ritt.md/obi-prompts)



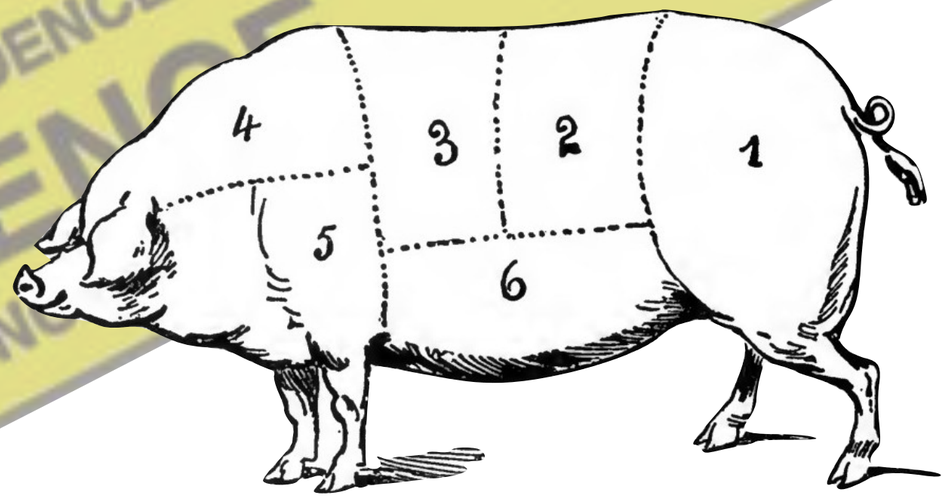
- Be smart about Dashboard and Analysis design - don’t cram everything into one page
  - Less clutter : Better user experience & Better performance

Not forgetting …

- Do It More Efficiently
  - Aggregation
- Do It Less Often
  - BI Server caching
- Database optimisation (partitioning, indexing, parallelism, statistics, etc)
- Balanced Hardware configuration

EVIDENCE-BASED DESIGN AND DIAGNOSTICS

- Do It Right, First Time
- Methodical analysis - “**nose to tail**”



I´m speaking @ OUGN VÅRSEMINAR 2015 12-14. MARS

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References & Further Reading

- Cary Millsap - "*Thinking Clearly About Performance*"
  - http://queue.acm.org/detail.cfm?id=1854041
- Blog series: OBIEE and Performance
  - http://ritt.md/obiee-performance
- obi-metrics-agent
  - http://ritt.md/oma-intro
- Greg Rahn - "*The Core Performance Fundamentals Of Oracle Data Warehousing – Balanced Hardware Configuration*"
  - http://wp.me/p3cJT-by
- Oracle documentation - "*Oracle® Database 2 Day + Data Warehousing Guide - Balanced Hardware Configuration*"
  - E25555-03

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